IN THE CLAIMS

Claims 1, 3, 5-6, 8, and 10-27 are presented as follows in re-written "clean" format.

--1. (Amended) An atomic layer deposition (ALD) thin film deposition equipment including a cleaning apparatus, comprising:

a reactor in which a wafer is mounted and a thin film is deposited on the wafer;

a first reaction gas supply portion for supplying a first reaction gas to the reactor;

a second reaction gas supply portion for supplying a second reaction gas to the reactor;

a first reaction gas supply line for connecting the first reaction gas supply portion to the reactor;

a second reaction gas supply line for connecting the second reaction gas supply portion to the reactor;

a first inert gas supply line for supplying an inert gas from an inert gas supply source to the first reaction gas supply line;

a second inert gas supply line for supplying the inert gas from the inert gas supply source to the second reaction gas supply line;

an exhaust line for exhausting the gas from the rector; and

a cleaning gas supply line connected to the first reaction gas supply line for supplying a cleaning gas for cleaning the reactor.--

--3. (Amended) The ALD thin film deposition equipment of claim 1, wherein the cleaning gas supply line comprises:

a cleaning gas mass flow controller for controlling the flow of a supplied cleaning gas; and

at least one valve for allowing or blocking the flow of the cleaning gas.--

--5. (Amended) The ALD thin film deposition equipment of claim 3, wherein the cleaning gas supply line further comprises a filter for filtering out foreign materials

existing within the cleaning gas.--

--6. (Amended) The ALD thin film deposition equipment of claim 1, wherein the first reaction gas supply portion comprises:

a bubbler for gasifying a first reaction material to form the first reaction gas;

a first reaction gas mass flow controller for controlling the flow of a first reaction gas supplied from the bubbler; and

a first valve installed on a line between the bubbler and the first reaction gas mass flow controller for allowing or blocking the flow of the first reaction gas.--

--8. (Amended) The ALD thin film deposition equipment of claim 1, wherein a first reaction gas supply portion comprises:

a thirty first valve for allowing or blocking the flow of the first reaction gas; and

a first reaction gas mass flow controller for controlling the flow of the first reaction gas which has passed through the thirty first valve.--

--10. (Amended) The ALD thin film deposition equipment of claim 1, further comprising:

a third reaction gas supply portion for supplying a third reaction gas to the second reaction gas supply line; and

a fourth reaction gas supply portion for supplying a fourth reaction gas to the second reaction gas supply line,

wherein the fourth reaction gas supply portion has a thirty second valve for allowing or blocking the flow of a fourth reaction gas, a fourth reaction gas mass flow controller for controlling the flow of the fourth reaction gas which has passed through the thirty second valve, and a thirty third valve for allowing or blocking the flow of the fourth reaction gas which has been controlled by the fourth reaction gas mass flow controller.--

--11. (Amended) The ALD thin film deposition equipment of claim 10, wherein the third reaction gas supply portion comprises:

a bubbler for gasifying a third reaction material to form the third reaction gas;

a third reaction gas mass flow controller for controlling the flow of the third reaction gas supplied from the bubbler;

a thirty fourth valve installed on a line between the bubbler and the third reaction gas mass flow controller for allowing or blocking the flow of the third reaction gas; and

a thirty fifth valve for allowing or blocking the flow of the third reaction gas, which has been controlled by the third reaction gas mass flow controller, to the second reaction gas supply line.--

--12. (Amended) The ALD thin film deposition equipment of claim 10, wherein the first reaction gas is a compound gas containing a transfer metal element selected from the group consisting of Ti, Ta and W, the second reaction gas is NH_3, the third reaction gas is TriMethylAluminum (TMA), and the fourth reaction gas is H_2.--

--13. (Amended) The ALD thin film deposition equipment of claim 1, wherein the reactor comprises:

a reactor block on which a wafer is mounted;

a shower head plate for maintaining a predetermined pressure constant by covering the reactor block;

a diffusion plate installed on a lower surface of the shower head plate, the diffusion plate having a plurality of spray holes formed over the wafer to spray the first reaction gas and/or inert gas transferred via the first reaction gas supply line onto the upper surface of the wafer, and a plurality of nozzles slanted toward the inner sidewall of the reactor block to spray the second reaction gas and/or inert gas transferred via the second reaction gas supply line; and

a wafer block installed within the reactor block, on which the wafer is seated.--

--14. (Amended) The ALD thin film deposition equipment of claim 13, further comprising a coolant passage in the shower head plate in order to decrease the temperature of the diffusion plate to a desired temperature range.--

--15. (Amended) A cleaning method for an ALD thin film deposition equipment comprising a reactor including a reactor block on which a wafer is mounted, a wafer block installed within the reactor block, on which the wafer is seated, and a diffusion plate having a plurality of spray holes formed over the wafer block and a plurality of nozzles slanted toward the inner sidewall of the reactor block to spray a gas toward the edges of the wafer block, the cleaning method comprising:

performing a main cleaning process in a state where no wafers are received within the reactor, including spraying a mixture of a cleaning gas and an inert gas onto the wafer through the spray holes and spraying the inert gas toward edges of the wafer block through the nozzles.--

--16. (Amended) The cleaning method of claim 15, wherein the main cleaning process further comprises setting the flow rate of the cleaning gas 50 SCCM or higher, and the inert gas mixed with the cleaning gas to the spray holes to be at 50 SCCM or higher, and setting the flow rage of the inert gas to the nozzles to be at 300 SCCM or higher.--

--17. (Amended) The cleaning method of claim 16, further comprising setting the inside pressure of the reactor to be 0.5 to 10 torr.--

--18. (Amended) The cleaning method of claim 16, further comprising setting the inside surface temperature of the reactor except for the wafer block to be 200 °C or less.--

--19. (Amended) The cleaning method of claim 15, further comprising performing a sub cleaning process in a state where no wafers are received within the reactor, including pulse-introducing the cleaning gas into the reactor to induce instantaneous diffusion due to a pressure fluctuation.--

--20. (Amended) The cleaning method of claim 19, wherein the sub cleaning process further comprises setting the flow rate of the cleaning gas to be at 50 SCCM or higher, setting the flow rate of the inert gas mixed with the cleaning gas to the spray holes

to be at 50 SCCM or higher, and setting the flow rate of the inert gas to the nozzles to be at 300 SCCM or higher.--

--21. (Amended) The cleaning method of claim 19, further comprising setting the inside pressure of the reactor to be 0.5 to 10 torr.--

--22. (Amended) The cleaning method of claim 19, further comprising setting the inside surface temperature of the reactor except for the wafer block to be 200 °C or less.--

--23. (Amended) The cleaning method of claim 15, further comprising performing a pre-coating process in a state where no wafers are received within the reactor, including adhering fine particles remaining within the reactor to the inside surface of the reactor.--

--24. (Amended) The cleaning method of claim 23, wherein the pre-coating process comprises spraying a first mixture gas of a first reaction gas and the inert gas onto the wafer block through the spray holes, and spraying a second mixture gas of a second reaction gas and the inert gas toward edges of the wafer block through the nozzles.--

--25. (Amended) The cleaning method of claim 23, wherein the pre-coating process comprises introducing a first mixture gas of a first reaction gas and the inert gas; introducing the inert gas without the first reaction gas for a predetermined period of time; introducing a second mixture gas of a second reaction gas and the inert gas into the reactor; and introducing the inert gas without the second reaction gas for a predetermined period of time.--

--26. (Amended) The cleaning method of claim 23, wherein the pre-coating process comprises introducing a first mixture gas of a first reaction gas and the inert gas and introducing the inert gas without the first reaction gas for a predetermined period of time in a state where a second reaction gas and the inert gas are continuously introduced

into the reactor.--

--27. (Amended) The cleaning method of claim 23, wherein the pre-coating process comprises introducing NH_3 gas into the reactor at least several seconds before introducing a first reaction gas into the reactor, when a compound gas containing Cl is used as the first reaction gas, and the NH_3 gas is used as a second reaction gas.--

IN THE ABSTRACT

Please replace the Abstract with the following rewritten, amended Abstract.

-- An atomic layer deposition (ALD) thin film deposition equipment having a cleaning apparatus, this equipment including a reactor in which a wafer is mounted and a thin film is deposited on the wafer, a first reaction gas supply portion for supplying a first reaction gas to the reactor, a second reaction gas supply portion for supplying a second reaction gas to the reactor, a first reaction gas supply line for connecting the first reaction gas supply portion to the reactor, a second reaction gas supply line for connecting the second reaction gas supply portion to the reactor, a first inert gas supply line for supplying an inert gas from an inert gas supply source to the first reaction gas supply line, a second inert gas supply line for supplying the inert gas from the inert gas supply source to the second reaction gas supply line, an exhaust line for exhausting the gas from the reactor to the outside, and a cleaning gas supply line connected to the first reaction gas supply line for supplying a cleaning gas for cleaning the reactor.--